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ABSTRACT

Intended for regular classroom teachers, the guide provides information on the educational needs of exceptional children who will be mainstreamed into the regular classroom. Data is presented in the form of answers to 35 questions which cover the following areas: definition and purpose of mainstreaming; developing student instructional programs; ways to handle social problems; referral procedures; treatment of students with medication; identification of and assistance with motor difficulties, auditory perceptual difficulties, and visual perceptual difficulties; suggestions for developing a mathematics program; commercially available criterion-referenced or concept-referenced tests for mathematical diagnosis; and the parent-teacher relationship. Also provided are a list of recommendations regarding parent counseling and an outline with information on visual perception, auditory perception, perceptual integration, language, and gross and fine motor skills. (SBH)

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THE CONCEPT OF MAINSTREAMING

A RESOURCE GUIDE

FOR REGULAR CLASSROOM TEACHERS

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PREFACE

In June 1975 the State Board of Education adopted revised Special Education Regulations (Title 22, Chapter 13) that mandate school districts and intermediate units to mainstream those exceptional children that could profit from such a program. In order to help facilitate the mainstreaming of exceptional children in the Commonwealth, this resource guide was developed to assist regular classroom teachers in becoming familiar with the educational needs of exceptional children who will either remain in the regular classroom or be returned to the regular classroom.

This document by no means answers every question that a regular classroom teacher may have regarding the concept of mainstreaming; however, we believe it is a good beginning.

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THE CONCEPT OF MAINSTREAMING

1. What is mainstreaming?

Mainstreaming is an educational process of maintaining or returning exceptional students who can best profit from such placement to the regular education classroom, with all needed supportive services provided.

2. How can I teach exceptional students when I do not have special education preparation?

Exceptional students are more similar to, than different from, other students. They generally progress through exactly the same developmental processes as normal students. However, the processes may be slower or inconsistent with other students at the same developmental level. The development may have been impaired by a loss of sight, hearing, coordination, or atypical socio-emotional development. The teacher should modify the manner in which he/she teaches to include small instructional steps. For example, a task which can be broken down into 3 sequential steps for a normal child may have to be broken down into 15 smaller sequential steps for an exceptional child.

3. What is the purpose of mainstreaming?

Its primary purpose is to enable students with minimal educational and behavior disturbances to participate in the normal classroom as much as possible so that they can be better prepared to take their place in society. When the student is unable to effectively learn under certain conditions, special personnel assist him/her to overcome the education debilitation through a sequenced set of instructional objectives. Those sequenced steps involve the development of an education plan.

4. What is an education plan?

A flexible plan comprised of the major social, psychological, academic, and vocational goals that will help a student achieve mutually agreed-upon life objectives.

5. What is an instructional objective?

An instructional objective serves as the foundation in the development of a total instructional program. There are two characteristics of an instructional objective:

a) what the teacher expects the student to obtain, and
b) the time period in which he/she can obtain it. For example, "John will be able to walk once across the balance beam without falling in 10 days." "John will identify on a map the 50 states within a month."

6. How are instructional objectives determined?

A test profile provides a graphic description of the results, indicating academic and learning aptitude strengths and weaknesses.

7. What is considered in developing instructional goals?

In formulating instructional goals, three questions should be considered:

a) Should the impetus of the educational program respond to a particular academic problem and provide remedial instruction?
b) Should the intervention be directed towards training a specific processing behavior, such as visual or auditory discrimination? (see appendix)
c) Should the priority be the modification of an overt behavior that interferes with the instructional process?

8. What is an initial instructional objective?

An initial instructional objective specifies a remedial skill which should be worked on because it affects the ability of the student to develop other more advanced skills.

9. What is a prescription?

A prescription is a written statement naming the instructional method and the material the teacher will use to enable the student to achieve the established instructional objective.

10. How can the instructional objective be evaluated?

There are two basic procedures for evaluating an instructional objective:

a) A preassessment and postassessment measure of the objective, indicating the student's strengths and weaknesses prior to and following instruction.
b) A criterion-referenced record of progress which indicates the daily achievement level. This record is based on the level of

achievement which the individual student can realistically be expected to attain.

11. What is the procedure to formulate a student's instructional program?

The following six instructional steps outline this procedure:

a) Specify the initial instructional objective.
b) Specify the teaching prescription.
c) Select the instructional material.
d) Specify the criterion expected level of success.
e) Evaluate the pupil performance.
f) If successful, specify the next logical instructional objective and repeat the sequence.

12. What if the student does not achieve the specified criterion level of success in his instructional program?

If the student does not achieve the specified criterion level of success, five questions are raised:

a) Is the initial instructional objective appropriate?
b) Is the teaching strategy the most efficient method of achieving the objective?
c) Is the instructional material the most appropriate?
d) Is the criterion level of success within the student's abilities?
e) Is there a need for reviewing the assessment information and modifying the initial program?

13. What are the responsibilities of a resource room teacher?

The resource teacher provides direct services to teachers, individual students, and small groups of students who are identified as exceptional by screening procedures but whose problems are not severe enough to warrant placement in full-time special education classes. This same resource teacher can provide the regular classroom teacher with alternative methods, materials, and/or criterion.

14. How do I, in my classroom of 30 students, provide a child with individualized instruction?

When a learning or behavior impaired student first enters your classroom a diagnosis of his/her strengths and weaknesses should be made. On the basis of the diagnosis, you should formulate instructional objectives for the student. As much as possible, these objectives should

coincide with those already developed for the rest of your class. Supplemental instructional materials geared to the student's specific educational level should be used to insure attainment of these objectives. These materials can be obtained through the resource room or itinerant teacher. If the child is not able to meet these instructional objectives, additional consideration should be given to the appropriateness of the placement or the sequential nature of the program in your class. Remember, even if the student does not participate fully in all activities, he/she can grow socially and educationally by the stimulation which the classroom activities provide.

15. How do I keep the other students from ridiculing the exceptional individual?

The students need to be made aware that everyone is different in his own way. Try as much as possible to treat the exceptional student the same way you treat other members of the class. Emphasize the similarities rather than the differences between the exceptional student and the rest of the individuals in the class. The goal is to help all people understand and live in harmony.

16. How am I supposed to handle a student during an emotional crisis?

A "crisis" involving an exceptional student is really no different from a crisis or problem involving any others in your class. Exceptional students are, first and foremost, persons. They respond to the same value appeals, threats, praise, and support that others do. Here are some things to keep in mind when a "crisis" occurs:

a) A crisis is a disruption in your program. *You* have a choice at this point. You must decide whether the student(s) involved and the issues are important or whether your program is important. If your program takes precedence, mete out whatever consequences you normally would. Be prepared, however, for "spillover" to occur sometime later that day or week. If the issue is not resolved by you, the student(s) will find some way to resolve it later. This may show up in the form of teasing, name-calling, pushing, fighting, or in some form of resistance to you, e.g., verbal abuse, refusal to cooperate. If you cope with the issue, you must realize that you may or may not be able to resolve it. Whether you do or not is unimportant. The fact that you recognize all students and their needs is important. This is what "building rapport" is all about.

b) Everyone involved in a crisis has his own point of view as to what precipitated and maintained the crisis. Your task is to:

(1) Calmly separate the children involved – physically if need be.

(2) Reassure each child that his/her point of view will be heard completely and without any judgment of right or wrong on *your* part.

(3) Piece the events together sequentially.

(4) Try to arrive at a conclusion. If you have conflicting evidence, you can:

(a) do nothing;

(b) put the children involved "on probation"; or

(c) administer whatever consequences you feel are appropriate. The important element here is to be fair. Students can accept differences in treatment as long as the differences are arrived at fairly.

c) A "crisis" can be a learning situation. The others in your class know when you have to deal with a serious problem. They generally will not become disruptive. They may talk among themselves, continue their seat work or projects, or do whatever else you suggest. The atmosphere of "seriousness" that prevails during a crisis is generally sufficient to maintain order in your room. A calm demeanor and stable emotional posture by the teacher also contribute to neutralizing a crisis and reestablishing order.

17. How do I manage a child who will be socially, emotionally, and educationally less mature than others in my class?

Initially, you should determine at what level the student is functioning in each of the developmental processes. Then set realistic expectancies based on those levels of development.

18. Will other children learn inappropriate behavior attitudes from the exceptional students in my class?

The range of abilities, interests, and behavior that you observe in the normal children in your class also exists among exceptional students. There is no reason to expect the behavioral differences of mainstreamed students to be so severe as to influence the behavioral attitudes of the others in your class.

The behavioral standards, rules, and consequences that you establish for your class should prevail for all – exceptional or not. The consistency and fairness with which you apply those rules and consequences

determine how the students will react and will be a measure of prevention. Keep in mind that exceptional individuals want to be like the others. Academics may be one area in which it might be most difficult for mainstreamed students to compete. The task may be easiest in terms of social behavior.

19. To whom do I refer the exceptional student in my class?

Every school system or administrative district within a school system has established referral procedures. You should become familiar with those procedures as well as the forms necessary to initiate action. You should also familiarize yourself with any referral procedures adopted by your particular school building which supersede any district action.

The fact that you have one or more exceptional students in your class should indicate that certain types of consultative assistance may be available to you in your building. The following referral model is predicated on the availability of resource staff. In some cases, resource assistance may be available on a regional basis, i.e., the consultants are assigned to serve several schools.

Your first source of assistance should be the consultants (guidance counselor, itinerant teacher, psychologist, reading or resource room teacher) serving your respective building. These consultants may have differing philosophies regarding intervention with exceptional children. Accept the existence of these differences! They do not indicate that the consultants have a lack of trust in one another. On the contrary, they represent the best possible information that different professional fields offer. Regardless of the similarities or differences between your consultants, you have *one major responsibility* to all of them: *Report facts – not hunches or impressions!*

The consultant's task is to interpret the information you provide regarding the student in question. If you report a series of assumptions, hypotheses, or exaggerations, the information you receive from your consultant will probably be of little use to you, since it will be founded on hunches or impressions. Report:

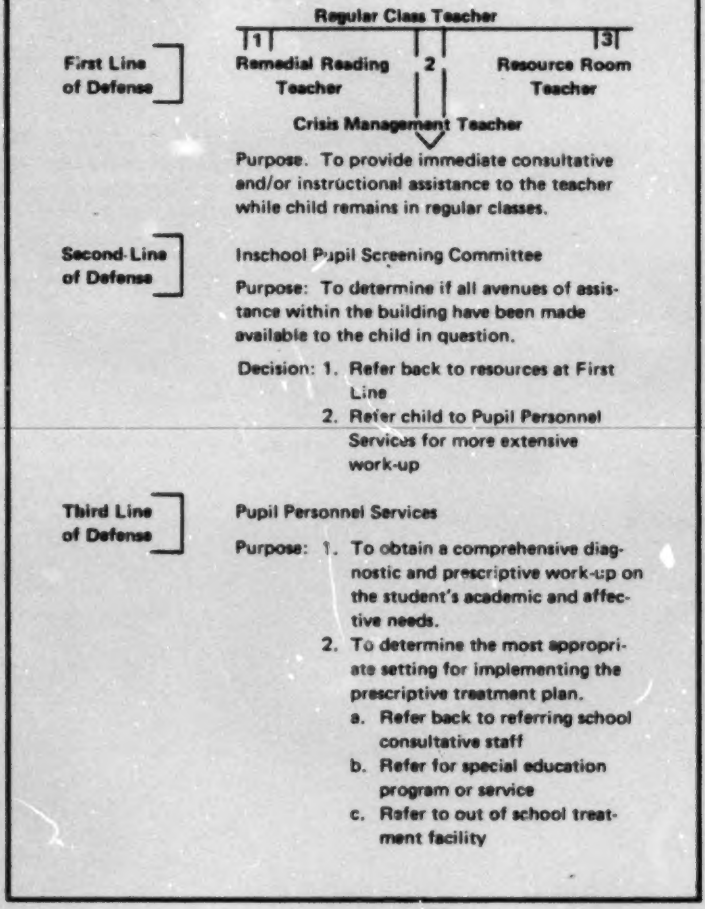
a) what you have tried with the student
b) how long your intervention program was conducted
c) what the student's response to your program was
d) what you think you would like to try next.

In some cases, behavior may be an issue. If so, report:

a) what you expect the student to do
b) what the student is doing
c) how often the student is not meeting your behavioral

expectations
d) your response to the student's behavior
e) the response of others to the handicapped student's behavior.

Figure 1: REFERRAL MODEL


Regular Class Teacher
1
2
3
First Line of Defense
Remedial Reading Teacher
Resource Room Teacher
Crisis Management Teacher
Purpose. To provide immediate consultative and/or instructional assistance to the teacher while child remains in regular classes.
Second Line of Defense
Inschool Pupil Screening Committee
Purpose: To determine if all avenues of assistance within the building have been made available to the child in question.
Decision: 1. Refer back to resources at First Line
2. Refer child to Pupil Personnel Services for more extensive work-up
Third Line of Defense
Pupil Personnel Services
Purpose: 1. To obtain a comprehensive diagnostic and prescriptive work-up on the student's academic and affective needs.
2. To determine the most appropriate setting for implementing the prescriptive treatment plan.
a. Refer back to referring school consultative staff
b. Refer for special education program or service
c. Refer to out of school treatment facility

20. When should a student be placed in a self-contained special class?

Several alternatives should be explored before this decision is reached. First, the student may be serviced by a resource teacher. Second, if the student is not responding in this situation, he/she can be moved to another regular classroom where his needs may be met. A different teaching style, or class structure may be more conducive to the educational and emotional needs of the student. Again, resource help may be made available if needed. The third alternative would be to place the student in a self-contained special class with one or two periods a day in a regular classroom. In this manner, the regular classroom becomes the resource room instruction available to the child.

21. How long will the special student be in my room?

This will depend upon the amount of progress the student makes. If he/she appears to be benefitting sufficiently from the normal classroom environment, then there is little reason to question the placement decision.

22. Who is a resource person?

An educator trained to diagnose and remediate learning and behavioral problems which exceptional children present.

23. When should the mainstreamed child receive extra help from a resource person?

When you find he/she cannot meet the instructional objectives of exceptional students in the normal classroom setting, then special education assistance from the resource teacher is possibly (sorely) needed. Usually the student will spend most of his/her time in the regular classroom. The resource room teacher also serves as a consultant, both to aid the teacher in remediating learning problems in the regular classroom setting and to offer suggestions for appropriate materials that may meet the needs of the child.

24. How do I program a child on medication?

Drugs have a definite but limited role in the treatment of students' learning and behavior problems. Drugs can be useful with *some* under *certain* circumstances. Reports vary, but it appears that 30 to 50% of those referred because of disruptive classroom behavior and/or poor academic achievement can be helped by chemotherapy (medication) alone

or in combination with psychotherapy, remedial tutoring, or special education programming. Perhaps the most appropriate way to analyze the previous statement is to point out that 50 to 70% of the children referred because of disruptive classroom behavior and/or poor academic achievement do not respond or are not appropriate candidates for chemotherapy.

The procedures under which you may administer medication varies by school district. Check to see if there are established policies for your district. Adhere to these policies, if for no other reason than your legal protection. The following guidelines will aid school systems in dealing with this situation:

a) Written orders are to be provided to the school from a physician, detailing the name of the drug, dosage, and the time interval in which the medication is to be taken. These orders are to be reviewed periodically.

b) A written request is to be received by the school district from the parent or guardian of the pupil, together with a letter from the physician indicating the necessity for the administering of the medication during the day, the type of disease or illness involved, the benefits of the medication, the side effects, and an emergency number where he can be reached. Both letters should be placed in the pupil's file.

c) Medication must be brought to the school in a container appropriately labeled by the pharmacy or physician.

d) The initial dose at school must be administered by the school nurse. If a teacher is to give subsequent medication, the nurse should discuss the medication, including its side effects, with the teacher.

e) The school nurse shall prepare a written statement to the building ing administrator as to the side effects of the drug, if any, and a copy should be placed in the pupil's file.

f) A locked cabinet must be provided for the storage of the medication. Opportunities should be provided for communication with the pupil, parent, and physician regarding the efficacy of the medication administered during school hours.

g) With the parent's and physician's consent, medication of a short-term duration may be administered by a teacher.

h) The school district retains the discretion to reject requests for administration of medicine.

You will need some information in order to effectively understand and teach a child who is on medication. With written parental per-

mission and through your school nurse, obtain the following information from the child's physician:

a) How does the medication work?

b) What change in the student's behavior can be expected?

c) What effect will the medication have on the child's attention span, memory, motor dexterity, personality, sleeping and eating habits?

d) Does the medication have undesirable side effects?

e) What behavioral and/or motoric reactions indicate that the dosage may be toxic or inadequate for the child's needs?

f) How long will the child have to take the medication?

g) Could the child become physically and/or psychologically addicted to the medication?

The most important aspect of chemotherapy is to understand that the use of drugs does not relieve the physician, parent, and teacher of the responsibility for seeking to identify and eliminate the factor(s) causing or aggravating the problem.

25. How do I identify and assist a child with gross and fine motor difficulties?

Students with gross motor difficulties exhibit problems in one or more of the following abilities: walking, running, throwing, jumping, and muscular development. Such students are generally described as clumsy, awkward, or poorly coordinated. They may bump into objects, be laughed at by their peers, and generally not included in group physical activities. The teacher may find through discussion with the child that he/she does not know the left side of the body from the right, up from down, cannot identify various body parts, and/or has a poor self-concept.

A variety of developmental activities should be provided to such a child to facilitate large motor movement and self-awareness. The following general activities can be offered:

a) walking to the left (directionality)

b) walking to the right (directionality)

c) showing the left ear (identification of body parts)

d) walking on a line without going left or right (balance)

e) squeezing a rubber ball, first with the left and then with the right hand

f) hopping across the room

g) swinging the arms above the head in left and right directions.

These developmental activities must be supplemented with others

which promote gross motor exploration of the environment. For further ideas related to gross motor development, consult the following:

Frostig, M. **Movement education: Theory and practice,** Chicago: Follett, 1970.

Vallett, R. E. **Programming learning disabilities.** Palo Alto: Fearon, 1969.

Students with fine motor difficulties have problems printing, writing, placing small objects into containers that approximate the size of the object, and coordinating their hands and eyes simultaneously. Students with fine-motor problems have deficits in one or more of the following areas: finger dexterity, eye movement, hand strength, awareness that the body has multiple sides (left, right, top, bottom, front, back), ability to adhere to space constraints, and writing and drawing with clarity. Their drawing and writing are often described as incomprehensible. A variety of activities can be developed for such students, including:

a) building objects with clay (clay should vary in degrees of hardness)

b) squeezing clothespins to build a lion's cage (finger strength and dexterity)

c) drawing and writing on surfaces that have lines which limit the amount of space the student can use (space containers)

d) tracking the movement of a pencil by moving only the eye while holding the head still (eye movement)

e) tracing letters and words initially, then slowly eliminating the tracing model, while encouraging the child to produce symbols without examples.

For further information related to fine motor training, consult the following:

Cratty, B. **Developmental sequence of perceptual motor tasks.** Freeport, N.Y.: Educational Activities, Inc., 1967.

Kephart, N. **The slow learner in the classroom.** Columbus, O.: Merrill, 1965.

26. How can I identify and assist a child with auditory perceptual difficulties?

Students with auditory perceptual difficulties generally attend to verbal discussion or instruction for only very short periods of time. They have problems in discriminating sounds and in retaining and recalling auditory experiences. They are often distracted during verbal discussion and are prone to be talking or looking out of the window. Such students are sometimes easily distracted by noises unrelated to the activities in which they are involved. Though all students can be distracted, the auditorially impaired student is more easily often diverted from his/her

task. This student has difficulty learning and retaining letter and word sounds, does not comprehend nor remember instructions, and exhibits verbal communication difficulties. Obviously, this student is a poor candidate for a phonics program, which emphasizes sound decoding. Other concomitant difficulties: poor attention span and unfamiliarity with the language or pronunciation. These individuals can be provided such activities as the following:

a) Exercises can train the student to discriminate loud and soft, high and low, quick and slow auditory signals

b) Activities can train the student to attend to a specific stimulus while other auditory stimuli (ground) are used to distract him/her. Such activities ought to make the desired sound (figure) dominant, but as the training proceeds the desired sound's dominant properties must be reduced so that the child is exposed to progressively more difficult figure-ground exercises.

c) A series of instructions is given to the student which he must follow in the correct sequence. The series is lengthened as the student demonstrates mastery in retaining and performing the tasks. Refer to the Appendix for an explanation of auditory perception.

For further information related to auditory training, see the following:

Bush, W. & Giles, M. T. **Aid to psycholinguistic teaching.** Columbus, O.: Merrill, 1969.

Johnson, D. & Myklebust, H. **Learning disabilities.** New York: Grune & Stratton, 1967.

27. How can a teacher identify and aid children with visual perceptual difficulties?

Visual impaired students have difficulty in all phases of the school academic program, which tend to be visually oriented. Impairments in visual perceptual processing can be identified if the student skips words and lines during reading (figure-ground), reverses letters or words (position in space), cannot identify the same or similar letters or letter clustering (discrimination), and/or has trouble properly ordering the sequence of letters or numbers (memory). These students have great difficulty with basal reading series, which emphasize the look-say strategy. They often are unable to reproduce writing on the chalkboard and have difficulty attending to visual tasks. Many activities are available to assist these children, e.g.

a) Have the child try to find hidden objects (figure-ground).

b) Provide the same letter in varying size, position, and type face and train the child to discriminate the invariant quality of the letter (discrimination).

c) Have the child pick out letters and words of the same construct but different positioning, i.e., *d/b, n/u, p/b, p/q, saw/was, rat/tar, but/tub* (position in space).

d) Sequence letters and words in proper order (memory). See Appendix for an explanation of visual perception. For further information related to visual perception training see:

Frostig, M. **The developmental program in visual perception.** Chicago: Follett, 1964.

Sabatino, D. A., Miller, S. R., & Sabatino, M. E. **Early childhood form constancy program.** Philadelphia: Buttonwood Farms, Inc., 1973.

28. What techniques will enable me to determine whether a child has a receptive, associative, or expressive language disability; and what can I do when the problem is identified?

Children with receptive language handicaps – whether the receptive process is visual or auditory – have difficulty comprehending what they perceive. The daily communication that takes place in the classroom is difficult to understand. For example, to determine whether auditory receptive language disabilities exist, such questions can be asked as, "Do teachers teach?", "Do books bounce?", and "Do children tattle?" Each of the preceding questions could be answered with a yes-or-no shake of the head. In the visual receptive area, pictures of objects which have the same and differing function can be shown, and the child asked to point to objects that are alike in function.

An associative task would require the child to respond to visual and auditory analogies. For example, visual analogies would show two pictures. The first might depict a boy and a picture of a shoe, indicating that boys go with shoes. Then a second set of pictures is shown of a girl, alongside of which are pictures of a cat, hat, seven, and a pencil. The child is expected to select the hat, since, like the shoe, it is a form of wearing apparel. Likewise, an auditory task would require response to a statement such as: "If trees are tall, then grass is _____." In the classroom, the child with associative learning problems has difficulty understanding the interrelationship between and among activities and experiences.

The two primary expressive processes are verbal and manual. The theories of Osgood and Kirk suggest that verbal expression is closely linked to auditory perception and association, while manual expression is linked to visual perception and association.

The teacher can assess a child's verbal expression by having him/her describe an object such as a pipe. Qualities the child can describe include: quantity, size, shape, color, consistency, usage, texture, etc. In manual expression the teacher can either give the object or a picture of the object to the child and ask the child to demonstrate its use. Children with the above problems seem to be aware of what is happening but are unable to communicate this awareness. As a result, they are often accused of being lazy or not interested.

It is essential that the teacher identify where the breakdown occurs. Many children who have the potential to learn are labeled retarded because an assessment of the learning breakdown has not been conducted. Such children do not usually participate in class activities and, when they do, their behavior is often inappropriate.

In working with such children the teacher need only expand the activities described above, as well as insure that visual and auditory reception and association training is conducted during reading, social studies, mathematics, and language arts, along with verbal and manual expression. (Refer to the Appendix for a discussion of language procedures.) For further information related to receptive, associative, and expressive training, consult the following:

Erlich & Snyder. **Instructional materials for exceptional children.** Elizabethon, Pa.: Continental Press, 1958.

Magic cards (and other materials). Oak Lawn, Ill.: Ideal School Supply Company.

29. What types of reading material can be used with children experiencing either visual, auditory, or motor expression difficulties?

a) Auditorily impaired children should be taught with a look-say reading strategy. Look-say reading is exemplified by the basal readers now in use in many regular classrooms. The *Ginn 360* and the *Harper-Row Series* are among those currently in use. The basal series must be supplemented by a language experience program:

Language Experience in Reading. Chicago: Encyclopedia Brittanica Press, 1970. A linguistics reading program, exemplified by either the SRA or Merrill programs.

Stauffer, R. G. **The language-experience approach to the teaching of reading.** New York: Harper and Row, 1970.

Each of these programs must be used in collaboration and not independently of the other.

b) Those with visual perceptual problems and intact auditory perception should be initially introduced to reading through a phonics

strategy, through a series like *DISTAR* or the *Alpha Series*. The intact learning channel is the one that must be emphasized. Strategy ought to be directed at the student's auditory perceptual process, since for this child it is the learning channel which most effectively discriminates, retains, and recalls information. The phonics program must be supplemented with another reading approach which remedies the visual perceptual weakness. A basal reader is recommended as a supplemental series since it remediates the student's weakness. The basal series should be used as a secondary source in the primary program until the youth has sufficiently developed adequate phonetic decoding skills. Ultimately, the student must be eased into the basal program totally, since phonetic programs conclude around the end of the third grade.

c) Students with severe motor or skeletal handicaps should not be exposed to a program which initially requires motoric responses. Tracing and copying letters should be avoided with such children. Reading is not a gross motor or manual function but an operation of processing data through the visual and auditory modalities. Consequently, such children should be exposed to a program emphasizing processing and not motor activity. Some of these programs are now available through teaching machines, which require the simple push of a button to demonstrate comprehension. (See Appendix for a discussion of fine and gross motor handicaps.)

30. What should I look for when contemplating using a mathematics program?

Before teachers begin using a specific mathematics program, they should find out whether or not that program has a number of necessary components or dimensions. Six of the most important components are listed and explained below.

a) *Flexibility*. A mathematics program must give the teacher a number of options or procedures for instructing the learner. It must also provide the learner with a wide range of alternative forms of response. Students often fail to learn not because of some inherent problem, but because alternative strategies are not available in the instructional process. A mathematics program must be flexible enough to allow the teacher and learner to interact in many different ways, providing the learner opportunity to acquire necessary mathematical concepts.

b) *Real-world relevance*. A good mathematics program must not only be interesting to the learner but must also provide necessary

experiences for him/her. A curriculum that does not have a direct relationship to real-life situations may not be motivating for the student.

c) *Diagnostic/prescriptive format.* A good mathematics program should have built-in preassessment and postassessment devices. These should measure a specific instructional objective outlined in the program. Only by stating an instructional objective as a link between the program-enabling step and assessment can effective mathematical instruction be achieved.

d) *Concept and skill emphasis.* It should be obvious that material that is learned and remembered is material that has meaning to the student. Concept learning and skill development in mathematics should be the keynote of a good mathematics program. A program that merely emphasizes computation without meaning is one that should be disregarded. Of prime concern here, therefore, is the development in the learner of the capability to satisfactorily function after he/she leaves school.

e) *Social skill development.* A good mathematics program should not only deal with the academics of mathematics but also with the inherent socialization skills that often play a part in mathematics functioning. Decision-making, discrimination, social responsibility, and cooperation are just a few of the social skills that should be built into a curriculum.

f) *Management-free.* A good mathematics program should be organized to fit into any classroom, regardless of the behavioral management approach being used by the teacher. It is a good idea to find a mathematics program that is more global in content and applicable to all management programs. For example, an open classroom arrangement may not allow for the use of a specific structured mathematics program. However, that same program may be totally applicable to a classroom where a teacher is able to select a mathematics program which fits his specific management scheme. Nonetheless, he must be keenly aware of the fact that the program he has chosen may be severely limited in terms of content.

31. Can you suggest a mathematics program or model which has all the necessary components?

Project MATH (in press) outlines succinctly a procedure for instituting an effective mathematics program in the classroom. At the same time, it interfaces very well with the components stated above. To clarify this, a statement of the components, as well as methods to

achieve these components, follows:

a) *Flexibility.* The mechanism of flexibility in the *Project MATH* Program is the Interactive Unit (IU): see figure 2. The IU describes the interaction between teacher and learner. The material can be presented and responded to in four ways, respectively. A teacher can construct something, present a picture or prearranged set of objects, say something, or write something. The learner, when interacting with the teacher, can construct something, identify something, say something, or write something. This provides flexibility both in terms of how the teacher and learner will interact and how the learner will demonstrate acquisition of specific mathematical concepts. Even though a learner may be a functional nonreader, there are twelve options available to the teacher for presenting information and eliciting a response from the learner.

b) *Real-world relevance.* The relevancy issue is met by two components of the *Project MATH* Program: (a) Every lesson is basically activity- or experience-oriented; (b) mathematics laboratories are instituted which deal with application of mathematical skills to applied situations. Each laboratory requires specific prerequisite mathematics skills on the part of the learner and develops necessary applied mathematical concepts.

c) *Diagnostic prescriptive format.* Continuous evaluation is the keynote in the *Project MATH* Program. Each lesson is accompanied by an evaluative criteria which is, in essence, a test item the teacher can use to assess the child's knowledge of a mathematical concept: (a) He can use the item to determine if he must instruct the child using that lesson; (b) he can use the item as a preassessment device before teaching that lesson; and (c) he can use the test item as a posttest device, after instruction of the lesson. In addition, the teacher may use the results of an evaluative criteria test item to prescribe not only specific math content but also more effective interactions (IUs).

d) *Concept and skill emphasis.* The project MATH Program deemphasizes computation, especially computation that requires rote memorization. The program emphasizes meaning (as a prerequisite of computation). In terms of concept and skill development, a number of mathematical areas are emphasized: pattern recognition, sets and operations, numbers and operations, geometry, fractions, measurement, and verbal problem solving. Verbal problem solving, which is necessary to develop concepts and applied mathematics skills, deals with mathematical problems that are imbedded in verbal phrases. Inability to solve a verbal

problem correctly may be due to a number of factors, i.e., reading level, vocabulary level, computational level, etc. What is necessary, therefore, is a model which presents verbal problems so as to control for all variables in determining student's strengths and weaknesses. An excellent model is that of a matrix on which verbal mathematical problems can be charted according to their various qualities. The components of this matrix follow:

(1) *Set complexity level* refers to the complexity of subject and object labels used in the question of a verbal problem.

(2) *Distracting versus non-distracting information* refers to the presence of nonpresence of information that is irrelevant to the solution of the problem.

(3) *Reading level* refers to the difficulty of the vocabulary used in the verbal problem.

(4) *Complexity level* (process) refers to the computational complexity of the problem.

The teacher may use the matrix by slotting in problems combining a number of components. The differences in the components of those questions which the learner answers directs the teacher to those areas in which the student is having difficulty.

e) *Social skill enhancement.* This component is heavily emphasized in the math laboratories. Each student has a responsibility to each one of the class members to complete his share of the laboratory. This forces the development not only of social responsibility but also of cooperation among the students.

f) *Management-free.* The *Project MATH* model can be employed easily in any classroom regardless of the management program being used by the teacher, as it emphasizes flexibility and has a multiple option format. (For further information related to *Project MATH,* contact Dr. John Cawley, Dept. of Educational Psychology, University of Connecticut, Storrs, Ct.)

Figure 2: INTERACTIVE UNIT MODEL

***Input (teacher)**	constructs	presents	states	graphically symbolizes (writes)
Output (student)	constructs	presents	states	graphically symbolizes (writes)

* In certain instances, another student may provide input.

32. What kind of information can I get from current devices used in assessing mathematics performance?

It is crucial that any diagnosis be part of a continuous process leading toward effective programming. It is not uncommon for teachers to be presented with results from various survey batteries (usually achievement tests) that supposedly assist in determining where the child is presently functioning. Unless the report from a test indicates a preferred instructional strategy, that report is basically useless. Any norm-referenced score (that is, a score that compares the child to others of his same age) does not really permit any direction for the teaching process. What is needed is a measure of a student's specific skills and deficits.

Another problem is that most tests measure computational level, a single mathematical skill; however, it is obvious that there is more to mathematics than mere computation. Instruments that provide a more in-depth analysis of covert, abstract conceptualization and reasoning skills are needed.

33. How can I assess mathematical skills?

Diagnostic instruments should be used that provide the following two components: (a) a depiction and delineation of specific mathematical skills in the form of behavioral or performance objectives, and (b) a prescription for instruction based upon a student's performance on a given formal or informal instrument or behavior observation device. Both of these components may be found in criterion-referenced tests and concept-referenced inventories. The former measure the acquisition of specific behaviors, prescribe instruction towards these behaviors, and then test acquisition. The latter measure a cognitive behavior and relate successful performance of that behavior to various preferred instructional concepts correlated with the behavior. (See Figure 3 for examples of these two methods.)

For the most part, these instruments should be teacher made, as the teacher is the best one to understand what he is doing in the classroom. By specifying behavioral objectives covering mathematical content, the teacher can formulate a specific criterion-referenced or concept-referenced test to allow for effective diagnosis leading toward proper prescription for his students.

Figure 3: EXAMPLE OF CRITERION REFERENCING

Objective Sequence		Criterion-Referenced Test Item
The student will:		
3.0	Demonstrate knowledge of class inclusion principle	The student will answer class inclusion question (3.6)
3.1	Identifies sets by visual characteristics (color, shape, size, etc.	If fails*
3.2	Identifies sets by language label characteristics (apples, pears, etc.)	
3.3	Identifies sets by category characteristics (apples and pears, both fruit)	
3.4	States cardinal property of subsets	
3.5	Compares cardinal property of subsets	
3.6	States subset to set comparison by classification (i.e., more fruit than apples)	
4.0	Demonstrates knowledge of operations in numbers	If passes*

EXAMPLE OF CONCEPT-REFERENCING

Concepts		Measure of Cognitive Behavior
1.0	Set theory	Order recognition
1.1	Recognition of sets	If successful*
1.2	Empty set	
1.3	1 to 1 correspondence	
1.4	Equivalent, more than, less than	
1.5	Set Operations	
2.0	Numbers and operations	Conservation of number
2.1	Cardinality	If successful*
2.2	Ordinality	
2.3	Addition	
2.4	Subtraction	

*Arrows indicate possible instructional objectives (criterion referenced) or instructional concepts (concept-referenced) to pursue.

34. Are there commercially available criterion-referenced or concept-referenced tests?

At the present time, there are a number of good diagnostic criterion-referenced or concept-referenced tests in mathematics that are commercially available:

a) *Fountain Valley Teacher Support System in Mathematics* (Richard L. Zweig Associates, Inc., Huntington Beach, California). FVTSS in Mathematics contains a number of criterion-referenced diagnostic tests which cover nine distinct math strands: (a) numbers and operations, (b) geometry, (c) measurement, (d) applications of mathematics, (e) statistics and probability, (f) sets, (g) functions and graphs, (h) logical thinking, and (i) problem solving. The criterion-referenced tests are self-scoring in nature. The teacher then obtains a student profile, determines the items which were missed by the youngster, and aligns these items with specific objectives. The teacher is then provided with a manual indicating which mathematics texts or programs cover that specific objective. Here, then, is a direct link between the results of the test and instructional options.

b) *Prescriptive Materials Retrieval System* (Select-Ed, Inc., Olathe, Kansas). The PMR system allows a teacher to match specific learner characteristics with material characteristics. Using this system, a teacher can identify materials that teach specific content, that are set into a specific format (e.g., filmstrip, programmed instruction, etc.), that are written according to a specific reading level, and that fit these specific instructional strategies. One component of the system is the Basic Educational Skills Inventory in Math (Select-Ed. 1972). This is very similar to a criterion-referenced device for supplemental testing, or it may be used to track skills that the child did not demonstrate to criterion. Approximately 55 to 65% of the materials cataloged in the PMR system are readily available in any well-equipped school system.

c) *Key Math* (American Guidance Service, Cinder Pines, Minnesota). Key Math is an individually administered diagnostic arithmetic test. It contains 14 subtests organized into three major areas: content, operations, and applications. Under the area of content, the authors have incorporated items that deal with the concepts of numeration, fractions, geometry and symbols. Applications deal with word problems, missing elements, money, measurement, and time. Operations basically deals with computation. Key Math provides the following information for a teacher: (a) a grade equivalent score which indicates how well a student performed on the entire

test; (b) a profile delineating the student's performance in each of the 14 skill areas, and (c) a description of each item's content as well as indication of a student's performance on that item. Although this inventory cannot be classified as a truly criterion-referenced instrument, an attempt has been made at using diagnostic results for effective instructional programming. (d) *Patterns Recognition Skills Inventory* (Hubbard-Scientific Co., Shermer Road, Northbrook, Illinois). The PRSI is designed to help educators and other specialists make certain determinations about students, including levels of readiness for functioning in language and mathematics, levels of development in reasoning skills, and appropriate curricular approaches. The inventory is arranged in four equivalent sets, each set consisting of 24 pattern tasks. Only one set (random selection) is presented to the subject. As a teacher presents each task, he instructs the subject to: (a) view the model pattern sequence; (b) view the four choice array of pattern sequences; and (c) make a choice from this array.

A response evaluation sheet provides information related to the three areas: (a) pattern task performance; (b) stimulus dimension performance; and (c) pattern performance. The author has related these performance areas to basic instructional implications (concepts) in language and mathematics which are listed in figures presented in the teacher's manual. The PRSI is a concept-referenced diagnostic inventory. Three of its components are of prime importance: (a) it requires no reading on the part of the student; (b) it was expressly designed to be used by teachers; and (c) the instructional implications figure in the manual pertaining to mathematics provides concepts listed in developmental order.

35. What kind of a relationship should I have with the parents of an exceptional child from my class?

Relationships with parents of mainstreamed exceptional children should be no different from those you have with parents of the other children in your class. You may expect more enthusiasm and cooperation from the parents of the mainstreamed children than from the other parents. Parents of exceptional children want an honest evaluation of their child's problems and capabilities. The following recommendations regarding parent counseling should help you relate effectively to all parents. Part A consists of *professional* do's and don'ts regarding parental counseling. Part B consists of recommendations offered *by parents* regarding the relationship they desire with teachers.

RECOMMENDATIONS REGARDING PARENT COUNSELING

A. *Professional* recommendations to *dilute, not dissolve,* your problems:

1. **DO:**
   a) Report social as well as academic behavior.
   b) Keep written records of behavior incidents (preferably witnessed copies) and classroom worksheets.
   c) Report only observable behavior, i.e., behavior relevant to the school situation.
   d) Admit when you do not know why a child acts as he/she does.
   e) Encourage parents to have regular conferences, particularly regarding behavior problems.
   f) Be honest with yourself and with the parent.
   g) Go out of your way to involve both parents. Failure to do so may lead to:
      (1) Distortions of the situation
      (2) Marital friction
      (3) Disregard of your recommendations
      (4) Undue responsibility on one parent, particularly when a placement decision may be involved
      (5) Disassociation of uninvolved parent from consequences
   h) Provide written feedback or follow-up of conference.
      (1) Give parents a document they or another professional can refer to at any time after the conference.
      (2) The written document reduces the chance a parent has of distorting and misunderstanding your concerns and recommendations.
   i) Convey (at the end of your conference) that your interest is the beginning, not the end, of your involvement. Indicate that you will continue to:
      (1) Provide remedial assistance, and
      (2) Seek additional diagnostic and treatment assistance.

2. **DON'T:**
   a) Diagnose, particularly behavior problems and suspicions of organic damage. *Describe* what you see; *don't interpret* it.
   b) Interject your peculiar sensitivities and private personality theory into your portrayal of the child.
   c) Keep secrets. A parent has a right to know that a child needs assistance. You are not deserting the child by sharing his/her problems in your classroom with parents. If you are concerned that a parent will punish the child, question yourself as to whether the child's needs are best met by selectively withholding information from his/her parents.

d) Use outdated, ambiguous, or unpleasant terminology.
e) Make long-term predictions.
f) Back down from a hostile parent when you know you are right. Rather,
   (1) Suggest talking to one parent at a time in this case.
   (2) Reschedule for another date, perhaps with the principal present.
g) Meet parents unprepared – be able to document your concerns.

B. Recommendations *by parents* to *dilute, not dissolve,* your mutual problems:
1. Do not ignore or overlook the fact that parents have certain problems to face: e.g.,
   a) Accepting the fact that their child may have a disability, defect, or imperfection. Partial or total nonacceptance of this fact creates emotional tensions in the parents.
   b) In cases where previous professional interventions have occured, parents may be reacting on the basis of inept, inaccurate, and ill-timed professional advice.
2. Give honest feedback as soon as possible.
3. Try to see both parents.
4. Use up-to-date terminology and down-to-earth language.
5. Recommend reading materials.
6. Show the parents how to teach things to their child.
7. Tell the parents what your behavioral and academic expectations are for their child.
8. Be willing to discuss the child's problem with the family doctor.
9. Know your resources.
10. Let the parents make their own decisions. Help them to see that it is their problem and their decision.
11. Help them to understand the problem.
12. Never put parents on the defensive.

Appendix

1. What is visual perception?

Visual perception includes four main areas:

a) *Visual discrimination* involves the ability to differentiate in some manner one form, letter, size, word, or color from another.

Example: Given the following figures, the child is instructed to find the one that is the same as the one in the box.

Form Constancy Program
(Sabatino, Miller, & Sabatino, 1973)

b) *Visual memory* is the ability to reproduce a visually presented stimulus after it has been removed.

Example: Show the child a single picture for 5 seconds. Remove it and ask him to find the same figure from six possible choices.(Multiple Choice Bender, 1973)

c) *Visual sequencing* is the ability to recall a series of visually presented items in the order presented.

Example: Show the child a series of figures for 5 seconds. Remove the series from view and have him/her identify the same from six possible choices.

c) *Visual figure-ground* is the ability to determine irrelevant stimuli, to pick the important stimulus from visually presented material.

Example: Show an appropriate drawing to the child and have him/her pick the type of figure that is hidden in the drawing from six possible choices.

2. What is auditory perception?

Auditory perception includes four main areas:

a) *Auditory discrimination* is the ability to differentiate among sounds.

Example: Say the sound *form* three times. Then say *foth, form, fog.* Ask child to tell whether *form* sound was in first, second or third position.

b) *Auditory memory* is the ability to retain information which is heard.

Example: Ask the child to repeat the following sentence after you have read it once: "At the summer camp the children get up early in the morning to go swimming."

c) *Auditory sequencing* is the ability to recall a series of sounds in the order presented.

Example: Say the following sounds in quick order: *Pa – ti – na;* then have the child pick position of correct sequence from the following orally presented responses: *ta – pock – na/pa – ti – na/la – tin – pa.*

d) *Auditory figure-ground* is the ability to attend to a specific sound stimulus smong other (usually less intense) stimuli.

Example: Ask child to repeat a sentence given at a time when considerable background noise is present in the classroom.

3. What is perceptual integration?

Perceptual integration involves three main areas:

a) *Visual-auditory perceptual-integration* is the ability to process information received through the auditory and visual modalities.

Example: Make the sound *baaa* and ask the child to show you the picture of the animal that makes such a sound from several possible choices.

b) *Visual-tactile/kinesthetic* is the ability to make motoric responses to the visual-tactile/kinesthetic cues.

Example: Ask child to trace the following figures with his finger:

c) *Auditory-tactile/kinesthetic* is the ability to make motoric response to auditory-tactile/kinesthetic cues.
Example: Place several small objects in a bag. Have the child reach into the bag and pull out, without looking, various designated objects, e.g., "give me the pencil."

4. What is language?

Language involves seven main skills:
a) *Representational concept formation* is the ability to recognize entities possessing more similar characteristics from entities possessing less similar characteristics.
Example: Show the child a series of pictures including several trees, bushes, shrubs, flowers, as well as unrelated objects. Ask him/her to identify all the pictures of trees.

b) *Non-representational concept formation* is the ability to recognize concrete relationships.
Example: Ask the child to crawl *under* the table or to hold his/her hand *over* the desk.

c) *Conceptual association* is the ability to recognize and/or formulate analogous relationships among entities and to engage in divergent thinking, finding entities possessing similar properties.
Example: Ask child to complete the following phrase: "Grass is green; sugar is _____." (Kirk, S., McCarthy, J., & Kirk, W., Illinois Test of Psycholinguistic Abilities [rev. ed.] Urbana: University of Illinois Press, 1968.)

d) *Conceptual mediation* is the ability to engage in convergent reasoning, finding similar properties among entities.
Example: Ask the child to name as many things as possible that are blue.

e) *Expressive inflection* is the ability to communicate meaning through appropriate use of vocal alterations of pitch, volume, and tone.
Example: Ask child to tell a story or listen while he/she is talking naturally, and note appropriate alterations of pitch, volume, and tone.

f) *Expressive syntax* is the ability to formulate sentences using proper sentence structures.
Example: Ask the child to tell a story and listen for appropriate sentence structures.

g) *Repetitive language* is the ability to understand and encode environmental information.

Example: General – observe and evaluate appropriateness of the child's overall responses to environmental demands. Specific – ask questions requiring minimal responses for answers, e.g., "Is water wet?"

5. What are gross motor skills?

Gross motor skills can be divided into five main areas:
a) *Coordination-balance* involves the health of the nervous system and the efficiency of the muscular system.
Example: (1) Coordination – ask the child to walk forwards, along the length of a standard, commercial balance beam.
(2) Balance – ask the child to place hands on thighs, one foot on the inside of the opposite knee, and to remain balanced in this position for at least 10 seconds.

b) *Strength-endurance* is the capacity to engage in muscular activity over a period of time.
Example: Have the child do pull-ups and/or hang from the horizontal bar, door frame, etc., for a reasonable length of time.

c) *Kinesthetic/motoric* is the awareness of positions taken by different parts of the body through muscular contraction, tension, and relaxation.
Example: (1) Place tape or chalk line on floor and ask child to walk along this line both forwards and backwards.
(2) Have the child lie on the floor and make "angels in the snow" movements.

d) *Body image* is the ability of the child to identify, locate, or explain the functions of the various body parts.
Example: (1) Mention the parts of the body and have the child point to the same. (2) Have the child state the functions of each part of the body.

e) *Directionality* is the development of external and internal awareness of "sideness."
Example: (1) External – ask the child to raise his/her left hand and to kick the right leg. (2) Internal – (a) note whether the child uses the same hand for writing and throwing a ball; (b) note handedness of child. See if this is the same as eyedness of the child. To note dominant eye, ask child to place index finger in front of nose with arm extended and both eyes open. The index finger will actually come to rest in front of the dominant eye.

6. What are fine motor skills?

Fine motor skills can be divided into three main areas:
a) *Manual dexterity* is the ability to make rapid and coordinated movements with the hands.
Example: Give the child a clean piece of paper and a pencil, and instruct him/her to make as many dots on the paper as possible in 15 seconds. The task should be repeated for both right and left hands.

b) *Tactile/haptic discrimination* is the information processed through the sense of touch via the fingers and skin surfaces.
Example: Have the child identify different textures by touch only. Materials that are soft, hard, coarse or smooth may be used.

c) *Eye/hand coordination* is the coordination of the eye with the motor movement of the hand.
Example: Toss a ball to the child with an underhand motion, instructing him/her to catch the ball in a cupped hand with the palm facing upward.